Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) In a spread spectrum, chip synchronous CDMA communication system, ~~the~~ a method of improving quality of services (QoS), increasing range of coverage and increasing traffic capacity wherein: ~~said~~ the spread spectrum, chip-synchronous CDMA communication system includes a multiplicity of user channels, each user channel including digital quadrature (I, Q) channels and a common multiplexer for ~~all said~~ the I, Q channels, ~~said~~ the method comprising ~~the steps of~~:

separately multiplexing ~~all said~~ the I channels and ~~all said~~ the Q channels into two separate constant-envelope baseband signals~~,~~ ;

baseband filtering both ~~said~~ constant-envelope baseband signals to produce baseband-filtered signals~~,~~ ;

upconverting both ~~said~~ baseband filtered signals to radio frequency (RF)~~,~~ ;

combining both ~~said~~ upconverted signals in quadrature at RF~~,~~ ; and

broadcasting the ~~said~~ upconverted baseband filtered signals at RF.

2. (Currently Amended) The method of claim 1, further comprising: ~~the step of~~ receiving from an external source, a set of chip-synchronous CDMA signals to be transmitted.

3. (Currently Amended) The method of claim 1, further comprising:

~~the step of~~ receiving from an external source a commanded RF power distribution among the ~~said~~ chip-synchronous CDMA signals to be transmitted.

4. (Currently Amended) The method of claim 1, further comprising:

~~the step of~~ selecting the instantaneous multiplex algorithm to achieve ~~said~~ a commanded RF power distribution among the ~~said~~ signals to be transmitted.

5. (Currently Amended) The method of claim 1, further comprising:

~~the step of~~ selecting, on a chip-by-chip basis, the polarity (± 1) of the I and Q chips ~~comprising~~ including the multiplexer output baseband signal.

6. (Currently Amended) The method of claim 1, further comprising: ~~the step of~~ generating two digital baseband signals consisting of the sequences of I and Q chips generated by the ~~said~~ multiplexer.

7. (Currently Amended) In a spread spectrum, chip-synchronous CDMA communication system, an apparatus for improving quality of service (QoS), increasing range of coverage and increasing traffic capacity wherein: ~~said~~ the spread spectrum, chip-synchronous CDMA communication system includes a multiplicity of user channels, each user channel including digital quadrature (I, Q) channels and a common multiplexer for ~~all said~~ the I, Q channels, ~~said~~ the apparatus comprising:

a multiplexer for separately multiplexing ~~all said~~ the I channels and ~~all said~~ the Q channels into two separate constant-envelope baseband signals~~,~~ ;

baseband filter for baseband filtering both said constant-envelope baseband signals to produce baseband-filtered signals~~,~~;

an upconverted for upconverting both ~~said~~ baseband filtered signals to radio frequency (RF)~~,~~;

a combiner for combining both ~~said~~ upconverted signals in quadrature at RF~~,~~; and broadcasting the ~~said~~ upconverted baseband filtered signals at RF.

8. (Currently Amended) The apparatus ~~defined in~~ of claim 7, further comprising:

a receiver for receiving from an external source a set of chip-synchronous CDMA signals to be transmitted.

9. (Currently Amended) The apparatus ~~defined in~~ of claim 7, further ~~including~~ comprising:

a receiver for receiving from an external source a commanded RF power distribution among the ~~said~~ chip-synchronous CDMA signals to be transmitted.

10. (Currently Amended) The apparatus ~~defined in~~ of claim 8, further ~~including~~ comprising:

a selector for selecting the instantaneous multiplexer algorithm to achieve ~~said~~ commanded RF power distribution among the ~~said~~ signals to be transmitted.

11. (Currently Amended) The apparatus ~~defined in~~ of claim 7, further ~~including~~ comprising:

a polarity selector for selecting, on a chip-by-chip basis, the polarity (±1) of the I and Q chips ~~comprising~~ including the multiplexer output baseband signal.

12. (Currently Amended) The apparatus ~~defined in~~ of claim 7, further ~~including~~ comprising:

a generator for generating two digital baseband signals consisting of the sequences of I and Q chips generated by the ~~said~~ multiplexer.

13. (Currently Amended) In a CDMA communication system having a multiplicity of user data channels each user data channel including quadrature (I, Q) channels and a common multiplexer for ~~all said~~ the I, Q channels, the ~~improvement~~ system for enhancing quality of service (QoS) and increasing traffic capacity comprising:

a baseband filter for baseband filtering ~~said~~ the I, Q channels after constant envelope multiplexing by ~~said~~ the multiplexer and;

an upconverter for upconverting the baseband filtered signals and broadcasting the upconverted baseband filtered signals at RF.

14. (Currently Amended) In a CDMA communication system, the method of improving quality of service (QoS) and increasing traffic capacity wherein:

~~said~~ the CDMA communication system includes a multiplicity of user data channels, each data channel including quadrature (I, Q) channels and a common multiplexer for ~~all said~~ the I, Q channels, said method comprising: ~~the steps of~~

baseband filtering ~~said~~ the I, Q channels after constant envelope multiplexing by ~~said~~ the multiplexer to produce baseband filtered signals; and

~~then~~ upconverting the baseband filtered signals and broadcasting the upconverted baseband filtered signals at RF.

15. (New) A method of multiplexing a plurality of input signals to form a single constant-envelope output signal, the input signals being chip-synchronous, the method comprising:

(a) evaluating on a chip-by-chip basis a logic value of the input signals; and

(b) generating a single constant-envelope output signal, a value of the single output signal being based on a function of the logic values of the input signals.

16. (New) The method of claim 15, wherein (a) includes

converting a logic value of the input signal on a chip to a numeric value.

17. (New) The method of claim 15, wherein (b) includes

applying multiplicative weighting factors to the numeric values of each chip;

summing the weighted numeric values;

extracting the algebraic sign of the sum of the weighted numeric values.

18. (New) The method of claim 17, wherein the weighting factors are determined by the commanded power distribution.

19. (New) The method of claim 18, wherein the weighting factors are pre-computed and tabulated.

20. (New) The method of claim 18, wherein the weighting factors are computed in real time.

21. (New) The method of claim 17, wherein the weighting factors are constant over a power control interval.

22. (New) The method of claim 17, wherein the weighting factors vary within the power control interval according to a predetermined pattern.

23. (New) The method of claim 22, wherein the predetermined pattern realizes a power distribution.

24. (New) The method of claim 15, wherein the input signals being classified in one of a first group and a second group based on a power allocation associated with the plurality of signals; and

the method further comprising:

determining weighting factors of input signals in the first group; and

determining weighting factors of input signals in the second group in a manner different from the first group.

25. (New) The method of claim 24, wherein the weighting factors of the signals in the first and the second groups are equal.

26. (New) The method of claim 15, wherein the plurality of input signals are Code Division Multiple Access (CDMA) data streams.

27. (New) The method of claim 15, wherein a multiplexing loss resulting from multiplexing the plurality of input signals is substantially the same for each of the plurality of input signals.

28. (New) An apparatus for multiplexing a plurality of input signals to form a single constant-envelope output signal, the input signals being ship-synchronous, the apparatus comprising:

a logic unit receiving the plurality of input signals; and

a signal generator generating a single constant-envelope output composite signal based on a function of the plurality of input signals.

29. (New) The apparatus of claim 28, wherein the logic unit weights values of the plurality of input signals to form weighted signal values, sums the weighted signal values to form a weighted sum, and sets a value of the single constant-envelope output signal in accordance with an arithmetic sign of the weighted sum.

30. (New) The apparatus of claim 28, wherein the logic unit weights the values of the plurality of input signals in accordance with a power allocation associated with the plurality of input signals.

31. (New) The apparatus of claim 29, wherein the logic unit determines weighting factors used to weight the values of the plurality of input signals each time the power allocation changes.

32. (New) The apparatus of claim 28, wherein the logic unit classifies each of the plurality of input signals into one of a first group and a second group based on a power allocation associated with the plurality of input signals, determines weighting factors of signals in the first group; and determines weighting coefficients of signals in the second group in a manner different from the first group.

33. (New) The apparatus of claim 28, wherein the weighting factors of the first and second groves are equal.

34. (New) The apparatus of claim 28, wherein the plurality of input signals are Code Division Multiple Access (CDMA) data streams.

35. (New) The apparatus of claim 28, wherein a multiplexing loss resulting from multiplexing the plurality of input signals is substantially the same for each of the plurality of input signals.

36. (New) An apparatus for multiplexing a plurality of input signals to form a single constant-envelope output signal, comprising:

means for generating a single constant-envelope output signal based on a weighted sum of the logic values of a plurality of input signals.

37. (New) The apparatus of claim 36, wherein the means for generating includes

means for weighting values of the plurality of input signals to form weighted signal values;

means for summing the weighted signal values to form a weighted sum; and

means for setting a value of the single constant-envelope output signal in accordance with an arithmetic sign of the weighted sum.

38. (New) The apparatus of claim 37, wherein the means for weighting weights the values of the plurality of input signals in accordance with a power allocation associated with the plurality of signals.

39. (New) The apparatus of claim 38, wherein the means for weighting determines weighting factors used to weight the values of the plurality of signals each time the power allocation changes.

40. (New) The apparatus of claim 36, wherein the means for generating classifies each of the plurality of input signals into one of a first group and a second group based on a power allocation associated with the plurality of input signals, determines weighting factors of signals in the first group; and determines weighting factors of signals in the second group in a manner different from the first group.

41. (New) The apparatus of claim 36, wherein the weighting factors of the first and second groves are equal.

42. (New) The apparatus of claim 36, wherein the plurality of input signals are Code Division Multiple Access (CDMA) data streams.

43. (New) The apparatus of claim 36, wherein a multiplexing loss resulting from multiplexing the plurality of input signals is substantially the same for each of the plurality of input signals.